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Predelivery Acceptance Test Procedures for the Human Research Facility (HRF) Workstation

LS-71042-10

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TITLE:

Predelivery Acceptance Test Procedures for the Human Research Facility (HRF) Workstation

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Predelivery Acceptance Test Procedures for the Human Research Facility (HRF) Workstation

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LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

A	Ampere
A/D	Analog to Digital
CDROM	Compact Disk, Read-Only Memory
COM	Communications Port
CPU	Central Processing Unit
CSCI	Computer Software/System Configuration Item
DSP	Digital Signal Processor
EIDE	Enhanced Intelligent Drive Electronics
EISA	Extended Industry-Standard Architecture (PC Bus)
FDC	Floppy Drive Controller
FRD	Functional Requirements Document
GSE	Ground Support Equipment
HRD	Hardware Requirements Document
HRF	Human Research Facility
I/O	Input/Output
ID	Identity
IRIG	Inter-Range Instrumentation Group [Serial Time Code Format]
IRQ	Interrupt Request
ISA	Industry Standard Architecture
LIME	Linear Insertion Mechanical Enclosure
MHz	Megahertz
MIP	Mandatory Inspection Point
N/A	Not Applicable
PC	Personal Computer
PCI	Peripheral Component Interconnect
PCMCIA	Personal Computer Memory Card International Association
PE	Project Engineer
Pwr	Power
QA	Quality Assurance
QAS	Quality Assurance Specialist
QE	Quality Engineer
RGB	Red, Green, Blue (video format)
SCSI	Small Computer System Interface
SDD	Software Design Document

TCP/IP	Transmission Control Protocol/Internet Protocol
TM	Technical Monitor
Vdc	Volts, direct current
VGA	Video Graphics Array
WS	Workstation

1.0 INTRODUCTION

This document describes the procedures for each of the Workstation (WS) circuit boards and data storage devices. It is proposed that in order to validate the test for each board/disk, the steps enumerated under that test be followed and be verified.

2.0 APPLICABLE DOCUMENTS

Document Number	Title
LS-71001	Functional Requirements Document for the Human Research Facility Workstation
LS-71020	Software Development Plan for the Human Research Facility
LS-71042-2	Hardware Requirements Document for the Human Research Facility Workstation
LS-71042-5	Software Test Plan for the Human Research Facility (HRF) Workstation

3.0 GENERAL REQUIREMENTS

3.1 FACILITY REQUIREMENTS

The HRF Workstation requires a 28 Vdc external power source capable of supplying 15 A.

3.2 TEST EQUIPMENT

All test equipment employed in performance of these tests shall be visually inspected for damage both prior to and after test. Calibration will be verified for equipment that requires calibration by inspection of the calibration sticker or documents.

4.0 QUALITY ASSURANCE REQUIREMENTS

All inspections and test monitoring shall be performed in accordance with Quality Assurance Plan for the Human Research Facility, LS-71030, unless otherwise specified.

4.1 ACCEPTANCE/REJECTION PROCEDURE

4.1.1 Acceptance

Each TPS operation step referencing performance of a procedure contained in this document shall be a Mandatory Inspection Point (MIP) step with pass and fail Quality Assurance Specialist (QAS) stamp blanks. The MIP operation shall be stamped noting successful completion (pass) or anomalous test procedure step (fail). Each procedure will contain QAS stamp blanks at steps requiring verification by a QAS.

4.1.2 Rejection

In case of noncomformance of any items during performance of a procedure contained in this document, the item shall be withheld and identified. The nonconformity shall be recorded on a "Discrepancy Report/Material Review Record," JSC Form 2167, in accordance with LS-71030.

4.2 PROCEDURAL DEVIATIONS

Any procedural deviations during performance of a procedure contained here shall be documented on a procedure deviation sheet (in Appendix B) that will be attached to the TPS. Any deviation shall require approval by the Project Engineer (PE) and Quality Engineer (QE).

5.0 RECORD CONTROL

Upon completion of a procedure contained in this document, a copy of this document, will be referenced and attached to the referencing TPS.

6.0 DESIGN REQUIREMENTS

The test procedures described in this document have the following traceability as indicated below in the table:

PDA Test Procedure Requirement (LS-71042-10)	Test Plan Requirement (LS-71042-5)	HRD Requirement (LS-71042-2)	FRD Requirement (LS-71001)
N/A	N/A	3.1.6.2	24.2.1, 24.2.3, 24.2.4, 24.2.6, 24.2.12, 24.2.13, 24.2.14, 24.2.17, 24.2.18, 24.2.19, 24.2.21, 24.2.22, 24.2.23, 24.2.25, 24.3.2, 24.3.6, 24.3.7, 24.3.8, 24.3.9, 24.3.10
7.2.2 CPU Test	3.1, 3.2	3.1.6.4.1.1, 3.1.6.4.1.2, 3.1.6.4.1.5	N/A
7.2.3 Ethernet Test	3.1, 3.2	3.1.6.4.1.1, 3.1.6.4.1.2, 3.1.6.4.1.5	N/A
7.2.4 RS422 Test	3.1, 3.2	3.1.6.4.1.1, 3.1.6.4.1.2, 3.1.6.4.1.5	N/A
7.2.5 DSP Test	3.1, 3.2	3.1.6.4.1.1, 3.1.6.4.1.2, 3.1.6.4.1.5	N/A
7.2.6 A/D Test	3.1, 3.2	3.1.6.4.1.1, 3.1.6.4.1.2, 3.1.6.4.1.5	N/A
7.2.7 Graphics Test	3.1, 3.2	3.1.6.4.1.1, 3.1.6.4.1.2, 3.1.6.4.1.5	N/A
7.2.8 Hard Drive Test	3.1, 3.2	3.1.6.4.1.1, 3.1.6.4.1.2, 3.1.6.4.1.5	N/A
7.2.9 IRIG Test	3.1, 3.2	3.1.6.4.1.1, 3.1.6.4.1.2, 3.1.6.4.1.5	N/A
7.2.10 Short Test	3.1, 3.2	3.1.6.4.1.1, 3.1.6.4.1.2, 3.1.6.4.1.5	N/A
7.2.11 Long Test	3.1, 3.2	3.1.6.4.1.1, 3.1.6.4.1.2, 3.1.6.4.1.5	N/A

7.0 TEST PROCEDURE

7.1 CONNECT TEST EQUIPMENT

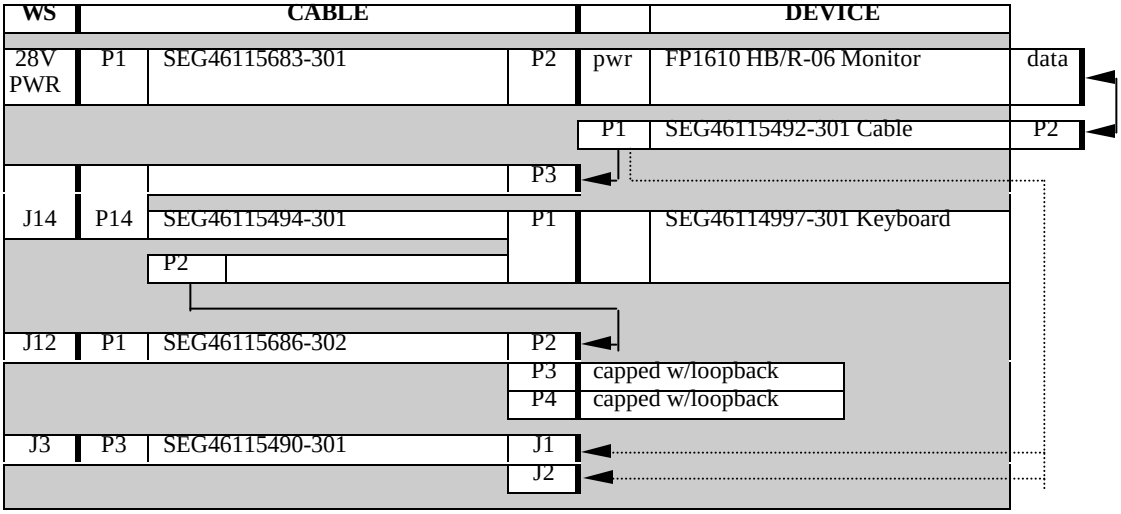
Step #	Procedure (7.1 Connect Test Equipment)	HRD Requirements	QA
	Connect Test Equipment to the Workstation.		
1.	Connect test equipment to the Workstation per Table 7.1-1: Connections for WS Testing. If using Class I/Flight Keyboard and/or Monitor, refer to Table 7.1-2: Connections for WS Testing with Flight Monitor and/or Keyboard for cabling and connections. Flight equivalents for other test cables may be used if available, refer to Table 7.1-3: Connections for WS Testing Using other Flight Items for connections.		
2.	Connect Laptop to the Workstation per Table 7.1-3: Connections for WS Testing Using other Flight Items.		
3.	Install mass storage devices (SCSI hard drives, Reader/ Writer assemblies with PCMCIA hard drives, etc.) to be tested at this time. Refer to Appendix B for setting device IDs and termination.		

TABLE 7.1-1. CONNECTIONS FOR WS TESTING

WS	CABLE				DEVICE	
J17	P17	(SEG38114992-701)	P1		(SCSI Device)	
J16	P16	SEG38115806-301	J1	J1	SEG38115802-301	
	P10	or	J2			
		SDD46116385-302 audio equalizer				
J14	P14	SEG38115015-301	P1		(Monitor)	
			P2		Keyboard	
			P3			
J15						
J12	P12	SEG38115796-301	P2		Mouse	
			P3	P1	SEG38115003-701	
			P4	P1	SEG38115003-701	
			P5			
J5						
			P1		(Parallel Printer)	
J11	P11	SEG38115797-302	P1			
J4	P4	SEG38115797-301	P1			
J10	P10	SEG46115679-701 Headset				
J3	P3	SEG38114993-303	P1		(Monitor)	
			P2		(Monitor)	
			P4	J4	SEG38115014-302	P1
			P5			
J9						
J6						
J7						
J8						
J2	P2	SEG38115795-301	P1		adapter cable	
J1		SEM38113199-302		SEM38112823-302 power supply		

NOTE: Items in parentheses ( ) are optional. They may be used but are not always required or are not always connected.

TABLE 7.1-2. CONNECTIONS FOR WS TESTING WITH FLIGHT MONITOR AND/OR KEYBOARD



NOTE 1: Dotted lines indicate alternative connections.

NOTE 2: RGB Cable SEG46115490-301 is not compatible with the SEG38115014-30x power adapter cable.

NOTE 3: Serial Breakout Cable SEG46115686-302 has as its cap a mating connector, wired for loopback function. The Ground Support Equipment (GSE) loopback assembly SEG38115003-701 is neither needed nor compatible with this cable.

TABLE 7.1-3. CONNECTIONS FOR WS TESTING USING OTHER FLIGHT ITEMS

WS		CABLE			CABLE/DEVICE
J11	P11	(SEG46115489-301)	P2		
J4	P4		P5		
J15	P1	SEG46115687-301	P2	J1	SEG46116862-301 to Laptop

NOTE: Items in parentheses ( ) are optional. They may be used but are not always required or are not always connected.

7.2 TEST PROCEDURES

7.2.1 Start Up

Procedures:

Step #	Procedure (7.2.1 User Interface Test)	HRD Requirements	QA
	Power on the Laptop.		
1.	Click switch on left side of laptop.		
2.	Wait for machine to boot into Windows 95. Login with no password.		
	Power on Workstation.		
3.	Set switch "Main Pwr" to "ON." This powers on the Workstation.		
	Boot into Windows NT 4.0.		
4.	When prompted to select operating system, select "Windows NT 4.0" and press "Enter." "Windows NT 4.0" is the default operating system; the Workstation will automatically boot into Windows NT 4.0 after 30 seconds if there is no user input.		
5.	If "Press Ctrl + Alt + Delete to log on" appears, do so. If logon information screen appears, type "hrf" in user slot, type "hrf" in the password slot and select "Enter." If "welcome" window appears, select "Enter." If a "One or more services…" message appears, select "OK."		
	Start the Program.		
6.	From the Start menu, select "Programs." From the Program menu, select "Workstation." The Workstation window will appear.	3.1.6.4.1.1, 3.1.6.4.8.2	
7.	Verify that the time in the upper right corner of the window is updating.	3.1.6.4.1.1, 3.1.6.4.8.2	
	Examine the Help File.		
8.	Click on the "Help" button.		
9.	Verify that the "Workstation Diagnostics Help" window appears on the left side of the screen.	3.1.6.4.1.1, 3.1.6.4.8.2	
10.	Verify that the title in the "Workstation Diagnostics Help" window is "Description of Workstation Diagnostics Menu."	3.1.6.4.1.1, 3.1.6.4.8.2	
11.	In the "Workstation Diagnostics Help" window, select "Exit" from the File menu. The window will disappear.	3.1.6.4.1.1, 3.1.6.4.8.2	

7.2.2 Central Processing Unit (CPU) Test

Step #	Procedure (7.2.2 CPU Test)	HRD Requirements	QA
	Perform the CPU Test only.		
1.	Click on the “Individual Tests” button. Select “CPU Test.”		
2.	In the “Save WinMSD Report” dialog box, click on “Save.”		
	Verify Test Results.		
3.	Verify that “CPU Test: OK” appears in the text box.	3.1.6.4.1.1, .1.2, .1.5	

7.2.3 Ethernet Test

Step #	Procedure (7.2.3 Ethernet Test)	HRD Requirements	QA
	Perform the Ethernet Test only. Note: Laptop IP address must be set to “100.120.120.21.”		
1.	Click on the “Individual Tests” button. Select “Ethernet Test.”		
2.	On the Laptop, select “Programs” from the Start menu. Select “Ethernet Test” from the Programs menu.		
3.	On the Workstation, select “OK” from the Start Program on HRF Portable Computer dialog box. The program on the Laptop will end itself as soon as it receives data from the Workstation.		
	Verify Test Results.		
4.	Verify that “Ethernet Test: OK” appears in the text box.	3.1.6.4.1.1, .1.2, .1.5	

7.2.4 RS-422 Test

Step #	Procedure (7.2.4 RS-422 Test)	HRD Requirements	QA
	Perform the RS-422 Test only.		
1.	Click on the “Individual Tests” button. Select “RS-422 Test.”		
	Verify Test Results.		
2.	Verify that "0 error(s) found" appears in the text box.	3.1.6.4.1.1, .1.2, .1.5	

7.2.5 Digital Signal Processor (DSP) Test

Step #	Procedure (7.2.5 DSP Test)	HRD Requirements	QA
	Perform the DSP Test only.		
1.	Click on the "Individual Tests" button. Select "DSP Test."		
	Verify Test Results.		
2.	Verify that "DSP Check Board Test: OK" appears in the text box.	3.1.6.4.1.1, .2, .5	
3.	Put on the Lightweight Headset with microphone on the right and position the Audio Equalizer for speaking.		
4.	Select "OK" in the Ready Audio Equipment dialog box.		
5.	Select "OK" in the Speak Into Microphone dialog box, and begin speaking into the Audio Equalizer.		
6.	Select "Yes" in the Confirm Voice dialog box if you hear your voice in the Lightweight Headset.		
	Verify Test Results.		
7.	Verify that "DSP Test stop voice feedthrough: OK" and "DSP Test voice feedthrough: OK" appear in the text box.	3.1.6.4.1.1, .2, .5	
8.	Select "OK" in the Voice Recording dialog box, and begin speaking into the microphone on the Lightweight Headset.		
9.	Select "OK" in the Left Ear Playback dialog box.		
10.	Select "Yes" in the Confirm Voice Left Ear dialog box if you heard the recording in the left ear of the Lightweight Headset.		
11.	Select "OK" in the Right Ear Playback dialog box.		
12.	Select "Yes" in the Confirm Voice Right Ear dialog box if you heard the recording in the right ear of the Lightweight Headset.		
13.	Select "OK" in the Doff the Earphones/Headset dialog box.		
	Verify Test Results.		
14.	Verify that "DSP Test voice playback left ear: OK" and "DSP Test voice playback right ear: OK" appear in the text box.	3.1.6.4.1.1, .2, .5	
15.	Remove the Lightweight Headset and put down the Audio Equalizer. The DSP Memory test has started and will last approximately 5 minutes.		
	Verify Test Results.		
16.	When the DSP Memory Test has finished, verify that "DSP Memory Test: OK" appears in the text box.	3.1.6.4.1.1, .2, .5	

7.2.6 A/D Test

Step #	Procedure (7.2.6 A/D Test)	HRD Requirements	QA
	Perform the A/D Test only.		
1.	Click on the "Individual Tests" button. Select "A/D Test."		
	Verify Test Results.		
2.	Verify that "A/D Test: OK at X volts" (where X is the test voltage) appears in the text box for –1.5 volt, -1 volt, -.5 volt, .5 volt, 1 volt, and 1.5 volt.	3.1.6.4.1.1, .2, .5	

7.2.7 Graphics Test

Step #	Procedure (7.2.7 Graphics Test)	HRD Requirements	QA
	Perform the Graphics Test only.		
1.	Click on the "Individual Tests" button. Select "Graphics Test." The Graphics Test will last approximately 10 minutes.		
2.	When the Graphics Test is complete, select "Yes" from the Confirm Graphics dialog box if you saw the graphics on the screen.		
	Verify Test Results.		
3.	Verify that "Graphics Test: OK" appears in the text box.	3.1.6.4.1.1, .1.2, .1.5	

7.2.8 Hard Drive Test

Step #	Procedure (7.2.8 Hard Drive Test)	HRD Requirements	QA
	Perform the Hard Drive Test only.		
1.	Record the types of drives to be tested in Table 7.2.8-1: Drives Installed. Indicate unused drive designations with "N/A" in the "Type" column.		
2.	Click on the "Individual Tests" button. Select "Hard Drive Test."		
	Verify Test Results.		
3.	Verify that all hard drives tested are listed as "Drive X: OK" (where X is the drive letter) in the text box.	3.1.6.4.1.1, .1.2, .1.5	

TABLE 7.2.8-1. DRIVES INSTALLED

Drive	Type (EIDE, SCSI hard drive, or SCSI Reader/Writer with PCMCIA hard drive)	Disk OK	Comment
C			
D			
E			
F			
G			
H			
I			
J			
K			

7.2.9 Inter-Range Instrumentation Group (IRIG) Test

Step #	Procedure (7.2.9 IRIG Test)	HRD Requirements	QA
	Perform the IRIG Test Only.		
1.	Click on the "Individual Tests" button. Select "IRIG Test."		
	Verify Test Results.		
2..	Verify that "IRIG Test: OK" appears in the text box.	3.1.6.4.1.1, .1.2, .1.5	
	Exit the Program.		
3.	Click on "Exit." Select "Yes" from the Exit dialog. The workstation window will disappear.		

7.2.10 Short Test

Step #	Procedure (7.2.10 Short Test)	HRD Requirements	QA
	Start the Program.		
1.	From the Start menu, select "Programs." From the Program menu, select "Workstation." The Workstation window will appear.		
	Perform the Short Test.		
2.	Click on the “Run Short Test” button.		
3.	Select "Yes" at the Confirm Short Test dialog box.		
4.	Select "OK" in the Ready Audio Equipment dialog box.		
5.	Put on the Lightweight Headset with microphone on the right, and position the Audio Equalizer for speaking.		
6.	Select “OK” in the Speak Into Microphone dialog box, and begin speaking into the Audio Equalizer.		
7.	Select “Yes” in the Confirm Voice dialog box if you hear your voice in the Lightweight Headset.		
8.	Select “OK” in the Voice Recording dialog box, and begin speaking into the microphone on the Lightweight Headset.		
9.	Select “OK” in the Left Ear Playback dialog box.		
10.	Select “Yes” in the Confirm Voice Left Ear dialog box if you heard the recording in the left ear of the Lightweight Headset.		
11.	Select “OK” in the Right Ear Playback dialog box.		
12.	Select “Yes” in the Confirm Voice Right Ear dialog box if you heard the recording in the right ear of the Lightweight Headset.		
13.	Select “OK” in the Doff the Earphones/Headset dialog box.		
14.	Remove the Lightweight Headset and put down the Audio Equalizer.		
15.	In the “Save WinMSD Report” dialog box, click on “Save.”		
16.	On the Laptop, select “Programs” from the Start menu. Select “Ethernet Test” from the Programs menu. Note: Laptop IP address must be set to “100.120.120.21.”		
17.	On the Workstation, select “OK” from the Start Program on HRF Portable Computer dialog box. The program on the Laptop will end itself as soon as it receives data from the Workstation.		
	Verify Test Results.		
18.	Verify that “DSP Check Board Test: OK”, “DSP Test stop voice feedthrough: OK”, “DSP Test voice feedthrough: OK”, “DSP Test voice recording: OK”, “DSP Test voice playback left ear: OK”, and “DSP Test voice playback right ear: OK” appear in the text box.	3.1.6.4.1.1, .2, .5	

7.2.10 Short Test (Cont'd)

Step #	Procedure (7.2.10 Short Test)	HRD Requirements	QA
19.	Verify that "CPU Test: OK" appears in the text box.	3.1.6.4.1.1, .1.2, .1.5	
20.	Verify that "IRIG Test: OK" appears in the text box.	3.1.6.4.1.1, .2, .5	
21.	Verify that "Ethernet Test: OK" appears in the text box.	3.1.6.4.1.1, .1.2, .1.5	
22.	Verify that "0 error(s) found" appears in the text box.	3.1.6.4.1.1, .1.2, .1.5	
23.	Verify that "A/D Test: OK at X volts" (where X is the test voltage) appears in the text box for –1.5 volt, -1 volt, -.5 volt, .5 volt, 1 volt, and 1.5 volt.	3.1.6.4.1.1, .2, .5	
24.	Verify that all hard drives tested are listed as "Drive X: OK" (where X is the drive letter) in the text box.	3.1.6.4.1.1, .2, .5	
	Exit the Program.		
25.	Click on "Exit." Select "Yes" from the Exit dialog. The Workstation window will disappear.		

7.2.11 Long Test

Step #	Procedure (7.2.11 Long Test)	HRD Requirements	QA
	Start the Program.		
1.	From the Start menu, select "Programs." From the Program menu, select "Workstation." The Workstation window will appear.		
	Perform the Long Test.		
2.	Click on the "Run Long Test" button.		
3.	Select "Yes" at the Confirm Long Test dialog box.		
4.	Select "OK" at the Ready Audio Equipment dialog box.		
5.	Put on the Lightweight Headset with microphone on the right and position the Audio Equalizer for speaking.		
6.	Select "OK" in the Speak Into Microphone dialog box, and begin speaking into the Audio Equalizer.		
7.	Select "Yes" in the Confirm Voice dialog box if you hear your voice in the Lightweight Headset.		
8.	Select "OK" in the Voice Recording dialog box, and begin speaking into the microphone on the Lightweight Headset.		
9.	Select "OK" in the Left Ear Playback dialog box.		

7.2.11 Long Test (Cont'd)

Step #	Procedure (7.2.11 Long Test)	HRD Requirements	QA
10.	Select “Yes” in the Confirm Voice Left Ear dialog box if you heard the recording in the left ear of the Lightweight Headset.		
11.	Select “OK” in the Right Ear Playback dialog box.		
12.	Select “Yes” in the Confirm Voice Right Ear dialog box if you heard the recording in the right ear of the Lightweight Headset.		
13.	Select “OK” in the Doff the Earphones/Headset dialog box.		
14.	Remove the Lightweight Headset and put down the Audio Equalizer.		
15.	In the “Save WinMSD Report” dialog box, click on “Save.”		
16.	On the Laptop, select “Programs” from the Start menu. Select “Ethernet Test” from the Programs menu. Note: Laptop IP address must be set to “100.120.120.21.”		
17.	On the Workstation, select “OK” from the Start Program on HRF Portable Computer dialog box. The program on the Laptop will end itself as soon as it receives data from the Workstation.		
18.	Wait. The DSP Memory test will last approximately 5 minutes. The Graphics Test will last approximately 10 minutes.		
19.	When the Graphics Test is complete, select “Yes” from the Confirm Graphics dialog box if you saw the graphics on the screen.		
	Verify the Test Results.		
20.	Verify that “DSP Check Board Test: OK”, “DSP Test stop voice feedthrough: OK”, “DSP Test voice feedthrough: OK”, “DSP Test voice recording: OK”, “DSP Test voice playback left ear: OK”, and “DSP Test voice playback right ear: OK” appear in the text box.	3.1.6.4.1.1, .2, .5	
21.	Verify that “CPU Test: OK” appears in the text box.	3.1.6.4.1.1, .1.2, .1.5	
22.	Verify that all hard drives tested are listed as “Drive X: OK” (where X is the drive letter) in the text box.	3.1.6.4.1.1, .1.2, .1.5	
23.	Verify that “Ethernet Test: "OK” appears in the text box.	3.1.6.4.1.1, .1.2, .1.5	
24.	Verify that the RS-422 Test "0 error(s) found" appears in the text box.	3.1.6.4.1.1, .1.2, .1.5	
25.	Verify that “A/D Test: OK at X volts” (where X is the test voltage) appears in the text box for –1.5 volt, -1 volt, -.5 volt, .5 volt, 1 volt, and 1.5 volt.	3.1.6.4.1.1,.2, .5	
26.	Verify that “IRIG Test: OK” appears in the text box.	3.1.6.4.1.1, .2, .5	
27.	Verify that “DSP Memory Test: OK” appears in the text box.	3.1.6.4.1.1, .2, .5	
28.	Verify that “Graphics Test: OK” appears in the text box.	3.1.6.4.1.1, .1.2, .1.5	

7.2.11 Long Test (Cont'd)

Step #	Procedure (7.2.11 Long Test)	HRD Requirements	QA
	View Log Files.		
29.	Click on the “Workstation Logs” button. Select “Main Log.”		
30.	Verify that Main Log file appears in “Notepad” window. (Date and Time stamp on each message line in file.)	3.1.6.4.1.1, 3.1.6.4.8.2	
31.	In the “Notepad” window, select “Exit” from the File menu. The window will disappear.	3.1.6.4.1.1, 3.1.6.4.8.2	
32.	Click on the “Workstation Logs” button. Select “CPU Log.”		
33.	Verify that CPU Log file appears in “Notepad” window. (“Microsoft Diagnostics Report” appears as the first text in the file.)	3.1.6.4.1.1, 3.1.6.4.8.2	
34.	In the “Notepad” window, select “Exit” from the File menu. The window will disappear.	3.1.6.4.1.1, 3.1.6.4.8.2	
35.	Click on the “Workstation Logs” button. Select “DSP Log.”		
36.	Verify that the DSP Log file appears in a “Notepad” window. (“DSP Board Automated Diagnostic” appears as the first text in the file.)	3.1.6.4.1.1, 3.1.6.4.8.2	
37.	In the “Notepad” window, select “Exit” from the File menu. The window will disappear.	3.1.6.4.1.1, 3.1.6.4.8.2	
38.	Click on the “Workstation Logs” button. Select “Graphics Log.”		
39.	Verify that the Graphics Log file appears in a “Notepad” window. (“Instructions to load results.txt into Excel” appears as the first text in the file.)	3.1.6.4.1.1, 3.1.6.4.8.2	
40.	In the “Notepad” window, select “Exit” from the File menu. The window will disappear.	3.1.6.4.1.1, 3.1.6.4.8.2	
	Exit the Program.		
41.	Click on “Exit.” Select "Yes" from the Exit dialog box. The Workstation window will disappear.		
	Exit Windows.		
42.	From the Start Menu, select “Shut Down.” Verify that “Shut down the computer?” is selected. Select “Yes.”		
	Power off the Workstation.		
43.	Set switch “Main Pwr” to “OFF.” This powers off the Workstation.		
	Exit Windows.		
44	On the laptop, select "Shut Down" from "Shut down the computer?" Select "Yes."		
45.	Power off the Laptop.		

8.0 CERTIFICATION OF COMPLETION

The HRF Workstation has been successfully tested to the testing procedures detailed in this document.

PE/TM	Date
QAS	Date

Complete

QAS

APPENDIX A

TEST EQUIPMENT

TEST EQUIPMENT

Hardware: Human Research Facility (HRF) Workstation SEG46114189-301
may include: HRF Workstation Keyboard SEG46114997-301
HRF Workstation Monitor SEG46114996-301

Software: WSOS1-1.FLT and WSLD4-2.FLT

Test Equipment:

Qty.	Part Number		Description
	GSE/Commercial	Class I/Flight	
1	(commercial)	FP1610HB/R-06	Monitor
1	---	SEG46115683-301*	HRF Common Power 28 Vdc cable
1	---	SEG46115492-301*	Workstation (WS) Monitor Cable
1	(commercial)	SEG46114997-801	Keyboard, PC-compatible
1	(commercial)	---	Mouse, serial
1	SEG38115015-301		Video graphics Array (VGA)/Keyboard Cable
		SEG46115494-301*	WS Keyboard/Mouse Cable
1	SEG38115796-301	SEG46115686-302*	Serial Cable (flight version includes the loopback as a connector cap)
2	SEG38115003-701	---	COM3 Loopback Cable
1	SEG38114996-701	---	Floppy/Parallel Cable
1	---	SEG46117305-301	SCSI Terminator
1	SEG38114993-303	SEG46115490-301*	red, green, blue (RGB) Breakout Cable
1	---	SEG46115679-701	Lightweight Headset
1	SEG38115806-301	---	Digital Signal Processor (DSP)/Audio Cable to DSP Breakout Box
1	SEG38115802-301	---	DSP Breakout Box
1	---	SDD46116385-302	Audio Equalizer System
1 1	SEG38115797-301 SEG38115797-302		Analog to Digital (A/D) Loopback Cable(s)
		SEG46115489-301	A/D/Video/IRIG-B Cable
1	SEG38115795-301	---	Rear Data Breakout Cable
1	---	---	DB25-TPS adapter cable
1	(commercial)	---	TPS-TPS cable
2	(commercial)	---	BNC-BNC cable
1	(commercial)	---	Single-ended/Differential converter
1	TSG200 or TSG100 (Tektronix)	---	National Television Systems Committee (NTSC) video generator

Qty.	Part Number		Description
	GSE/Commercial	Class I/Flight	
1	PVM8221	---	NTSC color monitor
4 min.	(commercial)	---	banana plug test cables
1	273-1455D (Radio Shack)	---	9 Vdc power adapter
1	19-315 (Radio Shack)	---	microphone
1	MCD-16X or CDR1610	---	Compact Disk, Read-Only Memory (CDROM) Drive and associated cables
1	V1000S	---	Jaz Drive and associated cables
1	SEM38113199-302	---	28 Vdc Power Cable
1	SEM38112823-301	---	28 Vdc Power Supply
AR	---	SEG46114191-301	Personal Computer Memory Card International Association (PCMCIA) hard drives
AR	---	SDG46114886-302	Small Computer System Interface (SCSI) Reader/Writer
AR	---	SEG46115663-30x where x = 1, 2, 3, 4, 5, or 6	SCSI Hard Drives
1	---	SDZ39129262-301	Portable Computer System
1	---	SEG46115488-301	Ethernet (Card/Cable)
1	---	SEG46115687-301	HRF Common Ethernet Cable
1	SED38115017-301	---	Alternating Current (AC) Power Adapter

*Use flight part when using flight monitor and/or keyboard

APPENDIX B

PROCEDURAL DEVIATION SHEET

PROCEDURAL DEVIATION SHEET

REPORT _____ NASA-JSC PAGE _____ OF _____

DATE _____

TEST ARTICLE:

P/N: _____ S/N(S): _____

TEST:

SECTION: _____ PAGE: _____

DEVIATION:

_____

_____

_____

_____

_____

REASON:

_____

_____

_____

_____

_____

APPROVALS:

PROJECT ENGINEER: _____

QUALITY ENGINEER: _____

APPENDIX C

HRF WORKSTATION BIOS SETTINGS

HRF WORKSTATION BIOS SETTINGS

STANDARD CMOS SETUP

		LBA Mode	Blk Mode	PIO Mode	32 Bit Mode
Date (mm/dd/yyyy):	[current date]				
Time (hh/mm/ss):	[current time]				
Floppy Drive A:	Not Installed				
Floppy Drive B:	Not Installed				
Pri Master:	Auto	ON	ON	4	OFF
Pri Slave:	Auto	ON	ON	4	OFF
Sec Master:	Not Installed				
Sec Slave:	Not Installed				
Boot Sector Virus Protection			Disabled		

ADVANCED CMOS SETUP

Quick Boot	Enabled
BootUp Sequence	C:, A:, CDROM
BootUp Num-Lock	ON
Floppy Drive Swap	Disabled
Floppy Drive Seek	Disabled
Mouse Support	Disabled
System Keyboard	Present
Primary Display	VGA/EGA
Password Check	Setup
Parity Check	Disabled
OS/2 Compatible Mode	Disabled
Wait for 'F1' If Error	Enabled
Hit 'DEL' Message Display	Enabled
Internal Cache	Writeback
System BIOS Cacheable	Enabled
C000, 16k, Shadow	Cached
C400, 16k, Shadow	Cached
C800, 16k, Shadow	Disabled
CC00, 16k, Shadow	Disabled
D000, 16k, Shadow	Disabled
D400, 16k, Shadow	Disabled
D800, 16k, Shadow	Disabled
DC00, 16k, Shadow	Disabled

ADVANCED CHIPSET SETUP	
DRAM Speed (ns)	60
DRAM Integrity Mode (ECC)	Enabled
DRAM Fast Leadoff	Disabled
DRAM Refresh Queue	Enabled
VGA Frame Buffer USWC	Disabled
PCI Fram Buffer USWC	Disabled
Fixed Memory Hole	Disabled
CPU to IDE Posting	Enabled
USWC Write Posting	Disabled
CPU to PCI Posting	Enabled
PCI to DRAM Pipeline	Enabled
PCI Burst Write Combine	Enabled
Read Around Write	Enabled
TypeF DMA Buffer Control	Disabled
TypeR DMA Buffer Control2	Disabled
USB Function Enable	Disabled
USB Keyboard Support	Disabled
USB Passive Release Enable	Enabled

PCI/PLUG AND PLAY SETUP	
Plug and Play Aware O/S	No
PCI Latency Timer (PCI Clocks)	64
PCI VGA Palette Snoop	Disabled
PCI IDE BusMaster	Disabled
OffBoard PCI IDE Card	Auto
OffBoard PCI IDE Primary IRQ	Disabled
OffBoard PCI Secondary IRQ	Disabled
DMA Channel 0	Pnp
DMA Channel 1	ISA/EISA
DMA Channel 3	ISA/EISA
DMA Channel 5	Pnp
DMA Channel 6	ISA/EISA
DMA Channel 7	ISA/EISA
IRQ5	ISA/EISA
IRQ9	PCI/Pnp
IRQ10	ISA/EISA
IRQ11	PCI/Pnp
IRQ15	PCI/Pnp
Reserved Memory Size	Disabled
Reserved Memory Address	C8000

PERIPHERAL SETUP	
OnBoard FDC	Disabled
OnBoard Serial Port1	Auto
OnBoard Serial Port2	Auto
OnBoard Parallel Port	378
Parallel Port Mode	Normal
OnBoard IDE	Primary

APPENDIX D

MASS STORAGE AND THE SCSI LINEAR INSERTION MECHANICAL ENCLOSURE (LIME)

MASS STORAGE AND THE SCSI LIME

D.1 OVERVIEW

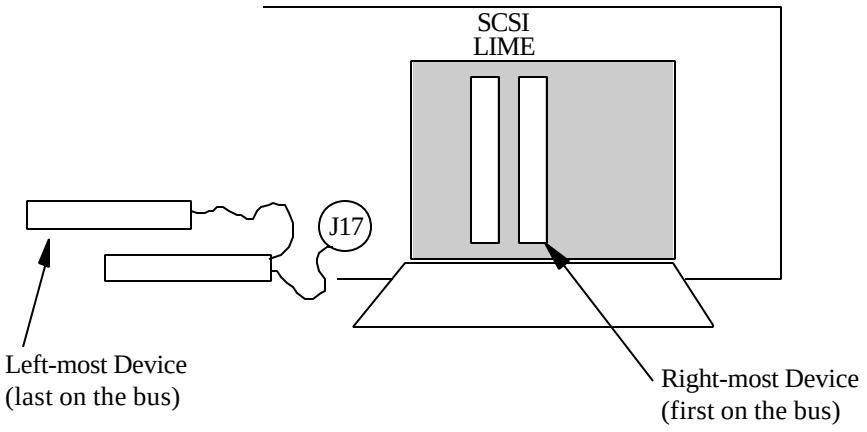
Internal to the Workstation are three hard disk drives. In the default configuration, two of the three drives are connected (and thus accessible) to the system. Of these two drives, one is a “primary” drive and the other is a “slave” drive.

Each drive that the system detects is assigned an alphabet designation in ascending order. Letter designations for the internal hard drives are set in the BIOS of the CPU board. Letter designations for devices on the SCSI bus are set by the SCSI controller board. The Workstation is configured such that the primary drive is always designated “C:”. Subsequent drives are designated “D:”, “E:”, and so on. Drive designation “A:” is reserved for the floppy drive.

The third internal drive is a back-up “C:” drive and is to be used under contingency situations where the primary drive of the default pair has failed. Switching to the back-up “C:” drive requires opening the lid of the Workstation, physically disconnecting the data cable from the default “C:” and “D:” drives, connecting the data cable of the back-up “C:” drive, and flipping the disk drive power switch. In effect, the default pair will then no longer be accessible to the system.

D.2 The SCSI Bus and Drive Designations

The next mass storage devices that the system will detect after the internal hard drives are devices on the SCSI bus. The SCSI bus proceeds from right to left (when viewing the Workstation front) in the SCSI LIME and then continues on to connector J17. Up to seven SCSI devices may be supported at any one time. The rightmost device will be detected first, and the leftmost will be detected last. To illustrate, the following diagram shows a possible configuration:



Note that devices need not be placed adjacent to each other in the SCSI LIME. Nor does the first device need to be in the right-most slot of the SCSI LIME.

Note also that the engraving on the door to the SCSI LIME is contradictory to the actual order on the SCSI bus.

Under normal operations, if the Workstation is able to boot up, then apparently the system was able to detect the “C:” drive. If another internal drive is not detected, then the next device on the SCSI bus detected will be designated the “D:” drive. Else the first device on the SCSI bus will be designated “E:”.

Under the DOS operating system, the first drive on the SCSI bus may be designated the “E:” drive regardless of whether internal IDE hard drives are detected.

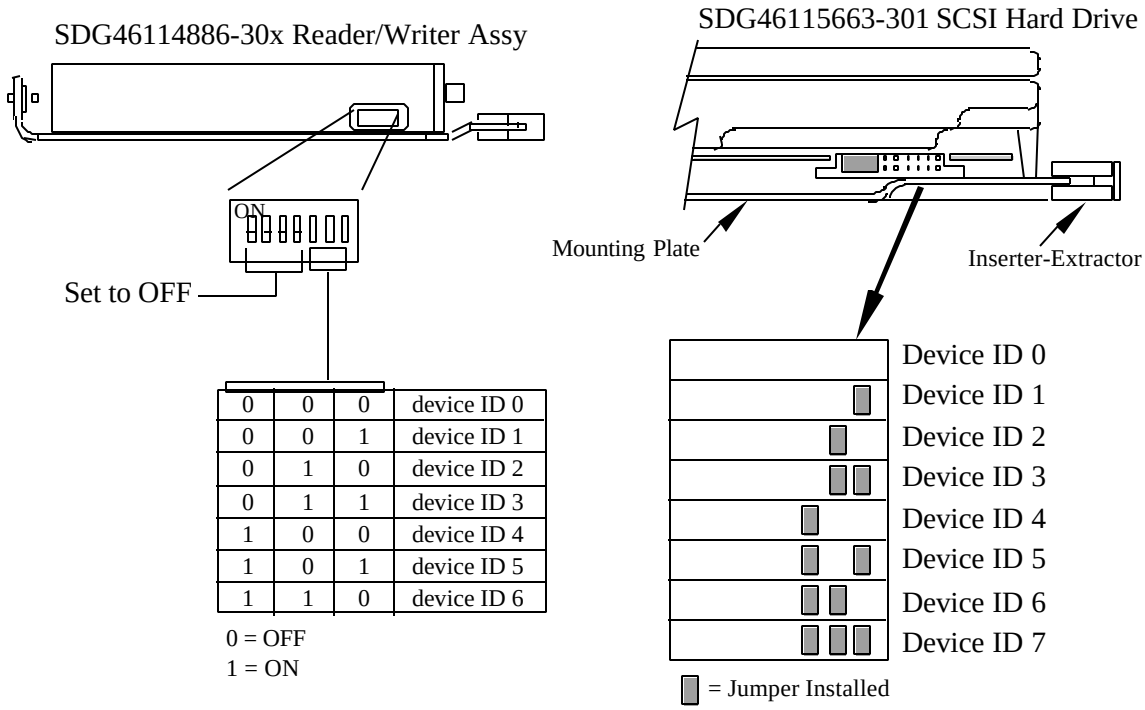
Under contingency situations where the internal drives are not accessible to the system due to some failure, the Workstation may boot up from the first drive on the SCSI bus, which is then detected as the “C:” drive.

D.3 DEVICE ID

Each device on the SCSI bus has a “device ID” value. The device ID has to be set by the user before inserting the device in the bus. This is usually done by setting DIP switches or jumpers across pins located on the device.

Rules for device IDs are as follows:

1. Each device on the bus must have a unique device ID; there must not be a duplication of device IDs on the SCSI bus.
2. Device IDs can be changed between uses of the drives; it does not affect the data it contains.
3. The preferred assignment of device IDs is that the first device has the lowest ID value (such as zero) and that subsequent drives on the SCSI bus have device IDs in ascending order, right to left.



D.4 SCSI TERMINATION

The last device on the SCSI bus must have termination installed. All other devices on the SCSI bus must be non-terminated for reliable operation.

The SDG46115663-301 SCSI hard drives are non-terminated and are not to be used at the end of the SCSI bus.

The SDG46114886-301 Reader/Writer Assemblies are termined and are to be used only at the end of the SCSI bus. The SDG46114886-302 Reader/Writer Assemblies are not terminated and are not to be used at the end of the SCSI bus.

The SCSI bus may also be terminated by installing the SEG46117305-301 SCSI terminator onto connector J17. In which case, all devices in the SCSI LIME bay may be non-terminated.

APPENDIX E

HRF WORKSTATION SYSTEM SETTINGS

HRF WORKSTATION SYSTEM SETTINGS

System Settings

<table>
<tr><th>Tab</th><th>Button</th><th>Information</th></tr>
<tr><td>System</td><td></td><td>Processor list:

0: x86 Family 6 Model 1 Stepping 9 GenuineIntel ~199 MHz
1: x86 Family 6 Model 1 Stepping 9 GenuineIntel ~199MHz</td></tr>
<tr><td>Resource</td><td>IRQ</td><td>01 i8042prt
03 Sermouse Serial Mouse (COM 2)
04 Serial Serial Port (COM 1)
05 Async530 Serial Port (COM 3)
05 Async530 Serial Port (COM 4)
07 Elnk3 Ethernet card (PCMCIA)
10 Elnk3 Ethernet card (ISA)
11 Nissm32K National Instrument A/D board
12 Brsnt DSP
14 atapi EIDE
20 glzmpd Z13 Graphics board
28 glzmpd Z13 Graphics board
76 aic78xx SCSI controller
80 glzmpd Z13 Graphics board</td></tr>
<tr><td></td><td>Input/Output (I/O) Port</td><td><table><tr><th>Address</th><th>Device</th><th>Bus</th><th>Type</th></tr><tr><td>0060-0060</td><td>i8042prt</td><td>0</td><td>Isa</td></tr><tr><td>0064-0064</td><td>i8042prt</td><td>0</td><td>Isa</td></tr><tr><td>0110-0110</td><td>Elnk3</td><td>0</td><td>Isa</td></tr><tr><td>01CE-01CF</td><td>VgaSave</td><td>0</td><td>Pci</td></tr><tr><td>01F0-01F7</td><td>atapi</td><td>0</td><td>Isa</td></tr><tr><td>0200-021F</td><td>Brsnt</td><td>0</td><td>Isa</td></tr><tr><td>0238-023D</td><td>Async530</td><td>0</td><td>Isa</td></tr><tr><td>0238-023D</td><td>Async530</td><td>0</td><td>Isa</td></tr><tr><td>0260-027F</td><td>Nissm32K</td><td>0</td><td>Isa</td></tr><tr><td>0280-028F</td><td>Elnk3 (PCMCIA)</td><td>0</td><td>Isa</td></tr><tr><td>0290-029F</td><td>WinRT</td><td>0</td><td>Isa</td></tr><tr><td>02F8-02FE</td><td>Sermouse</td><td>0</td><td>Isa</td></tr><tr><td>0300-030F</td><td>Elnk3 (ISA)</td><td>0</td><td>Isa</td></tr><tr><td>0378-037A</td><td>Parport</td><td>0</td><td>Isa</td></tr><tr><td>03B0-03BB</td><td>VgaSave</td><td>0</td><td>Pci</td></tr><tr><td>03C0-03DF</td><td>VgaSave</td><td>0</td><td>Pci</td></tr><tr><td>03F6-03F6</td><td>atapi</td><td>0</td><td>Isa</td></tr><tr><td>03F8-03FE</td><td>Serial</td><td>0</td><td>Isa</td></tr><tr><td>EC00-ECFF</td><td>aic78xx</td><td>0</td><td>Pci</td></tr></table></td></tr>
<tr><td></td><td>DMA</td><td><table><tr><th>Channel</th><th>Port</th><th>Device</th><th>Bus</th><th>Type</th></tr><tr><td>00</td><td>0</td><td>Async530</td><td>0</td><td>ISA</td></tr><tr><td>01</td><td>0</td><td>Async530</td><td>0</td><td>ISA</td></tr><tr><td>02</td><td>0</td><td>Async530</td><td>0</td><td>ISA</td></tr><tr><td>03</td><td>0</td><td>Async530</td><td>0</td><td>ISA</td></tr><tr><td>06</td><td>0</td><td>Nissm32K</td><td>0</td><td>ISA</td></tr><tr><td>07</td><td>0</td><td>Nissm32K</td><td>0</td><td>ISA</td></tr></table></td></tr>
<tr><td>Memory</td><td></td><td>Physical Memory (K)

Total: 261,556</td></tr>
</table>

CPU IDENTIFICATION

Type	Family	Model	Description
0	4	0 or 1	Intel486 DX processors
0	4	2	Intel486 SX
0	4	3	Intel 487 processor
0	4	3	IntelDX2 processor
0	4	3	IntelDX2 overdrive
0	4	4	Intel486 SL
0	4	5	IntelSX2
0	4	7	Write-Back Enhanced IntelDX2
0	4	8	IntelDX4 processor
0,1	4	8	IntelDX4 overdrive processor
0	5	1	Pentium processors (60, 66)
0	5	2	Pentium processors (75, 90, 100, 120, 133, 150, 166, 200)
1	5	1	Pentium overdrive processor for Pentium processor (60, 66)
1	5	2	Pentium overdrive processor for Pentium processor (75, 90, 100, 120, 133)
1	5	3	Pentium overdrive Processors for Intel486 processor based systems
0	5	4	Pentium processor with MMX technology (166, 200)
1	5	4	Pentium overdrive processor with MMX technology for Pentium processor (75, 90, 100, 120, 133)
0	6	1	Pentium Pro processor
0	6	3	Pentium II processor, model
0	6	5	Pentium II processor, model 5 and Celeron processor
1	6	3	Reserved for future overdrive Processor for Pentium Pro Processor

INTEL DOCUMENT: 2416809.PDF

ETHERNET CARD SETTINGS

ISA Ethernet card	3COM 3C509B-Combo version.
I/O address	0x300
IRQ	10
Device recognized as	Elink3 in the Windows NT Diagnostic/Resources/IRQ under Device.
bus option	ISA
TCP/IP IP address	10.12.12.250
Subnet mask	255.255.255.0

PCMCIA ETHERNET CARD SETTINGS

PCMCIA Ethernet card	3COM 3C589C
I/O address	0x280
IRQ	7
Device recognized as	Elink3 in the Windows NT Diagnostic/Resources/IRQ under Device
bus option	PCMCIA
TCP/IP IP address	100.120.120.251
Subnet mask	255.255.255.0

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